

WHAT IS CLAIMED IS:

1. A pelletized fill material for a halogen lamp comprising rhenium and a halogen.
2. The lamp fill material of Claim 1 wherein said halogen comprises bromine.
3. The lamp fill material of Claim 2 comprising a bromide of rhenium.
4. The lamp fill material of Claim 2 comprising rhenium tribromide.
5. The lamp fill material of Claim 1 comprising a mixture of a metal and a halide of rhenium.
6. The lamp fill material of Claim 5 comprising a mixture of rhenium and rhenium tribromide.
7. The lamp fill material of Claim 1 consisting essentially of rhenium and bromine.
8. The lamp fill material of Claim 7 consisting essentially of a mixture of rhenium and rhenium tribromide.
9. A pellet suitable for delivering a predetermined amount of rhenium tribromide into a lamp, said pellet comprising a metal and rhenium tribromide.
10. The pellet of Claim 9 wherein said metal has a melting temperature greater than about 1000°C and does not react with rhenium tribromide to form a stable bromide.
11. The pellet of Claim 9 wherein said metal comprises one or more metals from the group consisting of rhenium, palladium, platinum, rhodium, gold, molybdenum, and tungsten.

12. The pellet of Claim 11 wherein said metal comprises rhenium.
13. The pellet of Claim 11 wherein said metal comprises palladium.
14. The pellet of Claim 11 wherein said metal comprises an alloy of two or more metals.
15. The pellet of Claim 14 wherein said metal comprises an alloy of rhenium and palladium.
16. The pellet of Claim 11 wherein said metal comprises a mixture of two or more metals.
17. The pellet of Claim 9 consisting essentially of said metal and rhenium tribromide.
18. The pellet of Claim 17 wherein said metal has a melting temperature greater than about 1000°C and does not react with rhenium tribromide to form a stable bromide.
19. The pellet of Claim 17 wherein said metal comprises one or more metals from the group consisting of rhenium, palladium, platinum, rhodium, gold, molybdenum, and tungsten.
20. The pellet of Claim 19 wherein said metal comprises rhenium.
21. The pellet of Claim 9 comprising between about zero weight percent and about 25 weight percent rhenium tribromide.
22. The pellet of Claim 21 comprising about 0.5 weight percent rhenium tribromide.
23. The pellet of Claim 9 forming a disc.

24. The pellet of Claim 9 forming a sphere.
25. The pellet of Claim 9 wherein no dimension of said pellet is greater than about 2mm.
26. The pellet of Claim 9 suitable for introduction into a lamp through a tube having an inside diameter of about 2 mm.
27. The pellet of Claim 9 wherein the rhenium tribromide component of said pellet will sublime at temperatures greater than about 200°C.
28. The pellet of Claim 27 wherein the rhenium tribromide component of said pellet will decompose at temperatures greater than about 400°C.
29. The pellet of Claim 9 wherein the rhenium tribromide component of said pellet will decompose at temperatures greater than about 400°C.
30. A pellet suitable for delivering a predetermined amount of a halide of rhenium into the interior of the light emitting chamber of a lamp, said pellet comprising a metal and a halide of rhenium.
31. The pellet of Claim 30 comprising rhenium tribromide.
32. The pellet of Claim 30 wherein said metal comprises one or more metals from the group consisting of rhenium, palladium, platinum, rhodium, gold, molybdenum, and tungsten.
33. The pellet of Claim 32 wherein said metal consists essentially of rhenium.
34. The pellet of Claim 33 wherein the density of said pellet is between about 50 % and about 100 % of the density of pure rhenium.

35. The pellet of Claim 33 comprising about 0.5 weight percent rhenium tribromide and about 99.5 weight percent rhenium.

36. The pellet of Claim 30 comprising a mixture of metal powder and rhenium tribromide powder, wherein said metal does not react with said rhenium tribromide to form a stable bromide.

37. The pellet of Claim 30 comprising between about 2  $\mu\text{g}$  and about 2000  $\mu\text{g}$  rhenium tribromide.

38. In a method of dosing a lamp with lamp fill material including the step of introducing a pellet comprising the lamp fill material into the interior of the light emitting chamber of the lamp, the improvement wherein the pellet comprises rhenium tribromide.

39. The method of Claim 38 wherein said pellet consists essentially of rhenium and bromine.

40. The method of Claim 38 wherein said pellet comprises a metal and rhenium tribromide.

41. The method of Claim 40 wherein said metal comprises one or more metals from the group consisting of rhenium, palladium, platinum, rhodium, gold, molybdenum, and tungsten.

42. The method of Claim 38 wherein said lamp is a halogen lamp having a tungsten filament.

43. In a method of introducing a predetermined amount of rhenium and a halogen into the interior of the light emitting chamber of a halogen lamp, the

improvement comprising the step of introducing a pellet comprising rhenium tribromide into the interior of the chamber.

44. The method of Claim 43 wherein said pellet comprises a metal and rhenium tribromide.

45. The method of Claim 43 wherein said pellet material consists essentially of rhenium and rhenium tribromide.

46. A method of dosing a lamp with a predetermined amount of rhenium tribromide comprising the steps of:

- a. providing a powder comprising a metal;
- b. providing a powder comprising rhenium tribromide;
- c. mixing the metal powder and the rhenium tribromide powder;
- d. pressing the mixture of powders to form a solid pellet;
- e. dosing the lamp with the solid pellet to thereby introduce the predetermined amount of rhenium tribromide into the lamp.

47. The method of Claim 46 wherein the metal powder and the rhenium tribromide powder are mixed and pressed together without reacting the metal with the rhenium tribromide to form a stable bromide of the metal.

48. The method of Claim 46 wherein the metal comprises one or more metals from the group consisting of rhenium, palladium, platinum, rhodium, gold, molybdenum, and tungsten.

49. The method of Claim 48 wherein the metal comprises rhenium.

50. The method of Claim 48 wherein the metal comprises palladium.
51. The method of Claim 48 wherein the metal comprises an alloy of two or more metals.
52. The method of Claim 46 wherein the metal comprises a mixture of two or more metal powders.
53. The method of Claim 46 further comprising the step of hydrogen firing the metal powder prior to mixing the metal powder with the rhenium tribromide powder.
54. The method of Claim 46 wherein the pellet comprises between about 2  $\mu\text{g}$  and about 2000  $\mu\text{g}$  of rhenium tribromide.
55. The method of Claim 46 wherein the pellet comprises between about zero weight percent and about 25 weight percent rhenium tribromide.
56. The method of Claim 55 wherein the pellet comprises about 0.5 weight percent rhenium tribromide.
57. The method of Claim 46 wherein the density of the pellet is between about 10.5 g/cc and about 21 g/cc.
58. The method of Claim 57 wherein the density of the pellet is about 15 g/cc.
59. The method of Claim 46 wherein the density of the pellet is between about 50 % and about 100 % of the density of the metal.
60. The method of Claim 59 wherein the density of the pellet is about 60% the density of the metal.
61. The method of Claim 46 wherein the pellet generally forms a disc.

62. The method of Claim 46 wherein the pellet generally forms a sphere.
63. The method of Claim 46 wherein no dimension of the pellet is greater than about 2 mm.
64. The method of Claim 46 wherein the metal powder comprises particles less than about 75 microns in size.
65. The method of Claim 64 wherein the metal powder comprises particles less than about 30 microns in size.
66. The method of Claim 46 wherein the lamp is a halogen lamp having a tungsten filament.
67. The method of Claim 46 wherein the step of mixing is performed in an inert atmosphere.
68. A tungsten halogen lamp comprising:  
a sealed light emitting chamber formed from light transmissive material;  
a tungsten filament mounted internally of said chamber; and  
a pellet internally of said chamber, said pellet comprising rhenium tribromide.
69. The lamp of Claim 68 wherein said pellet comprises a metal and rhenium tribromide.
70. The lamp of Claim 69 wherein said metal comprises one or more metals from the group consisting of rhenium, palladium, platinum, rhodium, gold, molybdenum, and tungsten.

71. The lamp of Claim 70 wherein said pellet consists essentially of rhenium and rhenium tribromide.

72. The lamp of Claim 70 wherein said pellet consists essentially of palladium and rhenium tribromide.

73. The lamp of Claim 68 wherein said pellet sublimates at temperatures greater than about 200°C and decomposes at temperatures greater than about 400°C.

74. The lamp of Claim 68 wherein said pellet is mechanically mounted within the light emitting chamber.

75. The lamp of Claim 74 wherein said pellet is mechanically secured within a wire coil.

76. A tungsten halogen lamp comprising:  
a sealed light emitting chamber formed from light transmissive material;  
a tungsten filament mounted internally of said chamber; and  
a pellet internally of said chamber, said pellet comprising a metal and a halide of rhenium.

77. The lamp of Claim 76 wherein said pellet consists essentially of rhenium and bromine.

78. The lamp of Claim 76 wherein said pellet consists essentially of rhenium and rhenium tribromide.

79. The lamp of Claim 76 wherein said pellet generally forms a disc.



80. The lamp of Claim 76 wherein said pellet is mechanically secured within the chamber.

81. A halogen lamp comprising a lamp fill pellet mechanically secured within the light emitting chamber of the lamp.

82. The lamp of Claim 81 wherein said pellet comprises rhenium tribromide.

83. The lamp of Claim 81 wherein said pellet is mechanically secured within a glass tube integral with the chamber wall.

84. A method of introducing a lamp fill pellet into a fixed position within the light emitting chamber of a halogen lamp, comprising the steps of:

(a) providing a lamp body forming a light emitting chamber having an exhaust tube suitable for introducing lamp fill material into the interior of the chamber, the exhaust tube having an open end communicating with the interior of the chamber;

(b) introducing the lamp fill pellet into the exhaust tube;

(c) restraining the lamp fill pellet within the exhaust tube adjacent the open end of the exhaust tube communicating with the chamber;

(d) sealing the other end of the exhaust tube near the chamber wall so that the pellet is restrained within a portion of the tube between the seal and the open end of the tube.

85. The method of Claim 84 wherein the inner diameter of a portion of the exhaust tube adjacent open end thereof is restricted to thereby prevent the passage of the pellet through the restricted portion.

86. A pelletized fill material for a halogen lamp responsive to temperature for releasing bromine and rhenium over time.